



MISSOURI BOTANICAL GARDEN

PETER H. RAVEN LIBRARY



GEORGE ENGELMANN BOTANICAL NOTEBOOKS

Pagination Note:
Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

Drayman

Instructions for the Collection and Preservation of Botanical Specimens.

In gathering plants you will do well to pay attention to all the plants you come across, whether showy or unsightly. Do not neglect the latter on account of their appearance.

Collect if possible several specimens of the same plant, partly to show different states of the same species, and partly to be able to distribute them among different botanists.

Do not be deterred from gathering the same species at different places and seasons. It may prove not to be the very same species, but only an allied ~~or~~ species; or even if identical it is interesting for the study of geographical botany to have the same species from distant localities.

On the whole collect only such plants as you find in flower or fruit; but trees and shrubs ought to form an exception, as also smaller plants, if they afford some particular interest, either by their medicinal or other properties, great preponderance in certain districts, etc.

The most important part of the plant is the flower and fruit. Get if possible such specimens as present by both states, flower and fruit, or both on different specimens. You will find plants which have fertile and sterile flowers ^{distinct} ~~on the same plant~~. They occur either on the same plant, as in the oaks, hickories, etc., or on different plants, as in the willows, cottonwoods and others. In both cases it is important to collect specimens which show each of them.

Many plants develop the leaves after the flowers, as the oaks, redbuds and many others. In these the flowers must be preserved, and later in the season, the leaves with the fruits; but great care must be taken to get them from the same species.

If the specimen you obtain is not too large, gather it entire, with the root or at least with part of it, so as to show the nature of that organ. Try to have the lower as well as upper leaves complete on the specimen, especially if they should differ from each other.



0
cm

1

2

3

4

5

6

7

8

9

10

copyright reserved



MISSOURI
BOTANICAL
GARDEN

In case the specimen is too large for a sheet of paper, say more than 15 inches high, it may still be preserved entire, by bending or rather breaking (without entirely severing ~~its~~ the parts) the stem in an acute angle. If necessary, this may be repeated, and branches or leaves may also be treated in the same manner. ~~It is better than cutting it in different segments, as these might become separated and much confusion ensue from this cause.~~

Of still larger plants, shrubs, trees, it is only possible to take only a part, a branch, etc.; but if there should be different leaves on the plant, it will be necessary to cut off such leaves with a small piece of stem attached, and preserve them with the other specimens. ^{+ b/w}

Make the specimen large enough to present a fair sample of the plant, its manner of growth, ramification etc.

It will be well to put your specimens in paper as soon as gathered; Their parts are then fresh and stiff and are easily spread out in a neat way; but if they become flaccid they present much difficulty, and the dried specimens will appear unsightly.

* Large flowers specimens with thick stems or roots (bulbs especially) or even very clumsy ~~new~~ flowers (as large thistle heads) often require to be split lengthways, so as to make them less bulky and injurious to the other plants in the herbarium.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

Large fruits may be also split, or they may be preserved separately, wrapped in paper.

In putting up the specimens, spread them out in such a manner that all the different parts are seen, and the flowers, or some of the flowers, are laid open. If, however, time ^{should be} wanting, the plant may be laid in the paper just as it is.

The object of pressing plants, being to keep all the parts spread out smooth, and free from shrinking and wrinkling, but not to crush the more delicate organs, the flowers especially: the pressure should be moderate, say from 25 to 40 or at



0
cm

1

2

3

4

5

6

7

8

9

10

copyright reserved



MISSOURI
BOTANICAL
GARDEN

most 50 pounds in weight, so as not to compress nor destroy the organs, that they may afterwards be examined. In traveling two boards tightly strapped together will be quite sufficient to press plants. At home any weight ~~from~~ of 30 or 40 pounds will do the same service.

After the specimen has been put in paper and pressed, ^{a while} it becomes necessary to change the layers of paper as soon as they have become damp from moisture absorbed from the plant, and to substitute dry ones for them. This ought to be repeated daily till the specimen is completely dried.

The most convenient method is to put the specimen in finer paper, say printing paper, then a layer of 2, 4 or 6 sheets of coarser bibulous paper, then a finer sheet with a plant and so forth. In changing the plants dry layers are substituted for the moist ones without removing the specimen from the finer sheet immediately touching it, which would be a tedious job, often injuring the specimen. The damp layers are then hung up or spread out and dried. The dried specimens are put aside between single leaves or sheets of paper, as many in one sheet as may be put there without injuring each other. When you have got a sufficiently sized bundle together, pack it either in a box of convenient size or in a ^{fresh} skin of some animal (hair inside) which will harden and shrink and form an easily handled and safe package.

A specimen is of much less value if not properly labeled. Therefore as soon as collected or when put up, attach a piece of paper to it, (the most simple method is to stick the stem through a hole in the paper) on which you note at least date and locality, but if possible also every thing you can ascertain about the plant and which does not appear in the dried specimen itself: colour of flower, taste, smell, time of opening and closing of flowers, size of the plant, height, diameter of stem (in trees), nature of the soil (swamp, sand, rocks, open places, shade, etc.), whether frequent or rare. In parasitic plants it should be stated on which plant they grow.

0
cm

1

2

3

4

5

6

7

8

9

10

copyright reserved


 MISSOURI
BOTANICAL
GARDEN

Besides this it will be well to number your plants as you collect them. This number will stand for a name and can always be referred to, especially if you keep a journal or some other memoranda of your collections, or in correspondence with ~~your~~ other botanists, to whom specimens may be communicated.

You will further materially advance our knowledge of the vegetable kingdom, if you could collect any parts of plants or products of plants, which may be valuable or curious, such as medicinal roots, barks, gums, etc.

Make it an especial object to collect the fruits of plants which cannot be preserved in the herbarium, such as pinecones, nuts and others. Get also specimens of the woods. Of stems not thicker than 3 inches in diameter, take a whole piece 13 inches long, of larger ones only a section of the stem, showing bark, alburnum (exterior soft wood) and hard interior wood.

All such specimens of fruits, woods, roots, may very conveniently be ~~boxed~~ labeled and marked with the same numbers as the specimens ~~for~~ of the plant from which they are derived.

Collect also ripe seeds as many as you can get. Preserve them in their pods or fruits as they keep longer fresh there in them. In wrapping them up, put if possible, a few leaves, a small branch, flowers or whatever part you can get with them, and number them with the same number as the dried specimen of the same plant.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

Seeds ought to be sent as soon as possible, as many lose their power to ^{germinate} vegetate if too old. They ought to be packed dry but not too tight, as they may suffocate and moulder.



0
cm

1

2

3

4

5

6

7

8

9

10

copyright reserved



MISSOURI
BOTANICAL
GARDEN

I have more especially studied
~~I pay particular attention to~~ several families to which
I wish to direct your particular attention. I mention the
Asclepiadaceae and Euphorbiaceae, both comprising
plants with milky juice, the first mostly with showy,
umbellated flowers and silky appendage to the numerous
seeds, the other with very inconspicuous greenish flowers
and seeds. Further the Pines - then all the parasites
such as the Cuscutae (Dodder or Lovevine) and the
species of Viscum which grow on trees (Mistletoe) some
of them of great interest on Pines in the Pacific regions.

Above all others I mention the Cactus tribe,
which I have not only studied, but also cultivated.
Specimens of Cacti in flower and in fruit are important,
as well as entire plants, especially living ones for culti-
vation. For the herbarium the flower must be pre-
served with a piece of the plant attached to it, which
shows the ridges or tubercles and spines. In your labels
do not forget to describe the shape of the entire plant, num-
ber of ribs, number, shape, direction and color of spines
in each bunch.

The Cacti are easily propagated by seed, but
also living plants may be kept very long (from 6 to 12
months); they must be kept dry and not packed too close,
nor before they have been kept for some time withering, or
they will rot. Young plants are preserved better than old
ones in this manner.

I have found
The most convenient apparatus for drying plants in traveling
is the following. Stitch or paste 2 or 3 sheets of coarse soft brown
paper ^{together} at their backs, and string about 20 or 25 of such layers
on one string, each fastened ~~over~~ about one inch from the
next. Put them in a strong pasteboard portfolio, and
put several of these portfolios in a press of two pieces of
plank, strapped together tightly. The strings of layers, when
damp, are hung up and quickly dried, and put together
in the open air

0
cm

1 2 3 4 5 6 7 8 9 10

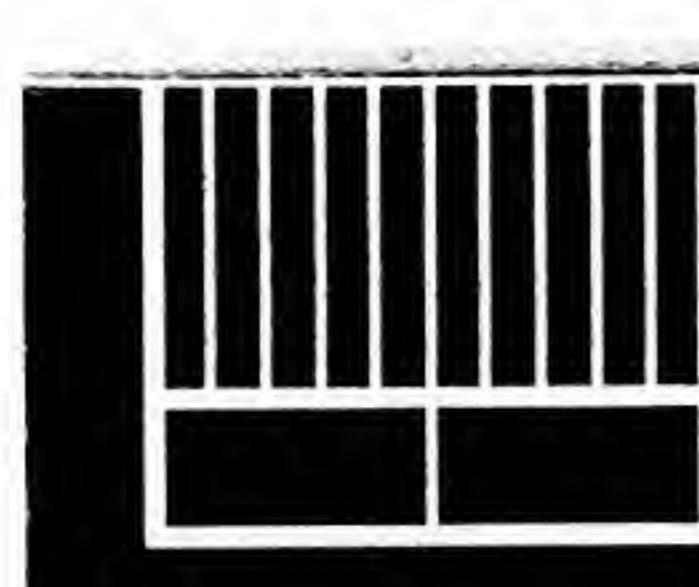
copyright reserved

MISSOURI
BOTANICAL
GARDEN

again without loss of time. *Finis*



MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS



0
cm

1

2

3

4

5

6

7

8

9

10

copyright reserved



MISSOURI
BOTANICAL
GARDEN